

# Eliminating external Merge

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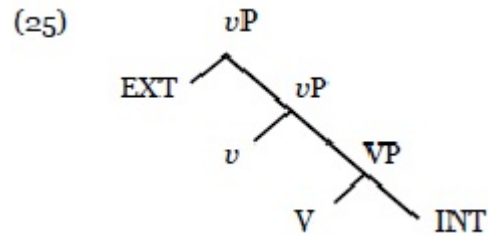
Incontro di Grammatica Generativa 43, Pavia, 15 February 2017  
Workshop Order and direction of grammatical operations

- (1)  $\{ \alpha, \beta \} \rightarrow \{ \alpha, \{ \alpha, \beta \} \}$
- (2) Internal Merge  
Combine  $\alpha \in \Gamma$  and  $\Gamma$
- (3) Extension Condition  
In (2), there is no  $\Gamma', \Gamma' \neq \Gamma$ , such that  $\Gamma \in \Gamma'$
- (4) Elements of the model of grammar
  - (i) a set of elements (Numeration)
  - (ii) an operation creating structure (Narrow Syntax)
  - (iii) an Externalization Procedure (interpreting the structure for sound and meaning)
- (5)  $\{ \alpha, \{ \alpha, \beta \} \} \equiv \langle \alpha, \beta \rangle$
- (6) External Merge  
Combine  $\alpha \notin \Gamma$  and  $\Gamma$
- (7) a. There seems  $\langle e \rangle$  to be a man in the room (Merge over Move)  
b. \* There seems a man to be  $\langle e \rangle$  in the room
- (8)  $\{ \alpha, \beta, \gamma \}$  (Numeration)
- (9)  $\{ \alpha, \{ \alpha, \beta, \gamma \} \}$  (Internal Merge)
- (10)  $\langle \alpha, \{ \beta, \gamma \} \rangle$  (ordered pair containing a set)
- (11)  $\{ \beta, \{ \beta, \gamma \} \} \equiv \langle \beta, \gamma \rangle$  (Internal Merge iterated)
- (12)  $\langle \alpha, \langle \beta, \gamma \rangle \rangle \equiv \langle \alpha, \beta, \gamma \rangle$  (ordered n-tuple)
- (13)  $\langle \alpha, \beta \rangle \langle \alpha, \gamma \rangle$
- (14)  $\langle \alpha, \beta \rangle \langle \alpha, \gamma \rangle \langle \beta, \gamma \rangle$  (process yields total/transitive/antisymmetric order)
- (15) Elements in the Numeration may be:
  - a. of a single unique type (say, words)
  - b. of any type, but homogeneous (all words, all morphemes, all features, etc.)
  - c. of any type (heterogeneous)
- (16) The world changes
- (17)  $\{ \text{the, world, changes} \}$  (homogeneous Numeration)
- (18)  $\langle \text{the, } \{ \text{world, changes} \} \rangle$  (wrong constituents)
- (19)  $\{ [\text{the world}], \text{changes} \}$  (Numeration must be heterogeneous)
- (20) Any element that is structured is derived by Narrow Syntax (4ii).
- (21) Any element that is structured is derived by a grammar as modeled in (4).

(22)  $\{ \alpha^F, \beta \} \rightarrow \{ \alpha^F, \{ \alpha^F, \beta \} \} \equiv \langle \alpha^F, \beta \rangle \rightarrow \langle \alpha^F, \beta^F \rangle$  (Feature sharing)

(23)  $\langle [\text{the world}]^{3SG}, \text{change}^{3SG} \rangle$

(24) The output of a derivation (4) is accessible to the Numeration (4i) and to the Externalization Procedure (4iii)



(26)  $\{ v, \text{kill} \}$

(27)  $\langle v, \text{kill} \rangle \rightarrow \text{kill}$  ( $v$ -V complex created in separate derivation)

(28)  $\text{kill}_{\langle AG, TH \rangle}$  (noun phrases not merged inside  $vP$ )

(29)  $\{ \text{spiders, mosquitos, kill}_{\langle AG, TH \rangle} \}$

(30)  $\langle \text{spiders, } \{ \text{mosquitos, kill}_{\langle AG, TH \rangle} \} \rangle$

(31) The first element merged is interpreted as subject

(32)  $\langle \text{spiders, } \{ \text{mosquitos, kill}_{\langle AG, TH \rangle} \}_{(SU=?)} \rangle$

(33)  $\langle \text{spiders, } \langle \text{mosquitos } \{ \text{kill}_{\langle AG, TH \rangle} \}_{(SU=?)(OB=?)} \rangle \rangle$

(34)  $\langle \text{spiders, } \langle \text{mosquitos } \langle \text{kill}_{\langle AG, TH \rangle} \{ \emptyset \}_{(SU=AG)(OB=TH)} \rangle \rangle \rangle$  (argument resolution)

(35) Generalized Integrity  
Given a derivation  $\Delta = \langle \text{Num, NS, Ext} \rangle$ ,  
operations in NS affect no element  $\varepsilon$  such that  $\varepsilon \notin \text{Num}$  (no External Merge)

(36) Spiders seem to kill mosquitos (A-movement)

(37)  $\{ \text{spiders, mosquitos, seem, kill} \}$

(38)  $\langle \text{spiders, mosquitos, seem, kill} \rangle$

(39)  $\langle \text{spiders, } \langle \text{mosquitos } \langle \text{seem } \langle \text{kill}_{\langle AG, TH \rangle} \{ \emptyset \}_{(SU=AG)(OB=TH)} \rangle \rangle \rangle \rangle$

(40) operator-variable constructions (A'-movement)

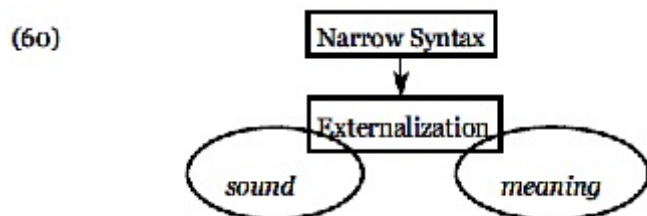
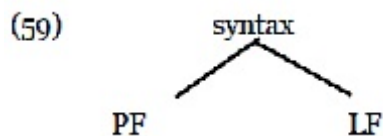
- a. *wh-movement*  
(I wonder) which mosquitos [ spiders kill ]
- b. *relative clause formation*  
mosquitos (that) [ spiders kill ]
- c. *'topicalization'*  
(but) mosquitos, [ spiders kill ]

(41) Spiders kill mosquitos

(42) derivational interaction points (cf. (24))

- a. Numeration construction
- b. Externalization procedure

- (43) a. Numeration may include a variable element (vbl)  
 b. a ban on vacuous quantification (i.e. *vbl* must be bound at some point)
- (44) { spiders, *vbl*, kill<sub>(AG,TH)</sub> }
- (45) < spiders, *vbl*, kill<sub>(AG,TH)</sub> >
- (46) < spiders, *vbl*, kill<sub>(AG,TH)</sub> >*e* (marking for unbound variable)
- (47) { [which mosquitos], < spiders, *vbl*, kill<sub>(AG,TH)</sub> >*e* } (operator added at Externalization)
- (48) < [which mosquitos], < spiders, *vbl*, kill<sub>(AG,TH)</sub> >*e* >
- (49) *A'-movement locality principle*  
 An ordered n-tuple containing a variable is merged with an operator binding that variable  
 (i.e. not with any element not being such an operator)
- (50) \* Which mosquitos do you wonder why [ spiders kill *e e* ]? (leaves one vbl unbound)
- (51) you think spiders kill mosquitos/*vbl*
- (52) { you, think, spiders, kill, mosquitos/*vbl* }
- (53) < you, think, spiders, kill, *vbl* >*e*
- (54) { [which mosquitos], < you, think, spiders, kill, *vbl* >*e* }
- (55) < [which mosquitos], [you think spiders kill]*e* >
- (56) (I wonder) which mosquitos you think spiders kill
- > also CED, CSC, Weak Islands  
 > no recourse to phases needed
- (57) Externalization  
 i. replace abstract syntactic elements by items from the vocabulary (lexical insertion)  
 ii. provide an operator to bind unbound variables  
 iii. linearize the ordered n-tuple in a modality specific organization (typically a string of sounds)  
 iv. apply semantic interpretation rules (such as  $\lambda$ -conversion, reference resolution, etc.)
- (58) <  $\alpha$ ,  $\beta$  >  $\rightarrow$   $\alpha\beta$  (linearization)



- (61) *bottom-up*
  - a) node affected has no mother node
  - b) creates a new node that has no mother node
- (62) *top-down*
  - a) node affected has no daughter node
  - b) creates a new node that has no daughter node
- (63) a. *mother*  
 $\alpha$  is the mother of  $\beta$  iff  $\alpha$  is the result of Merge affecting  $\beta$ 
  - b. *daughter*  
 $\alpha$  is the daughter of  $\beta$  iff  $\beta$  is the result of Merge affecting  $\alpha$

> process proposed here is neither bottom-up nor top-down (but looks more top-down)

- (64) *bottom-up*
  - a. the internal structure of  $\alpha$  undergoing Merge is given (actual)
  - b. Merge does not increase the internal structure of  $\alpha$  undergoing Merge
- (65) *top-down*
  - a. the internal structure of  $\alpha$  undergoing Merge is not given (potential)
  - b. Merge does increase the internal structure of  $\alpha$  undergoing Merge

> elements in the Numeration may be complex (output of previous derivations)

> on this criterium, the process is clearly not top-down

> top-down/bottom-up dichotomy is an artificial by-product of the separation of the Numeration from the Object Under Construction, requiring **transfer** (spatial metaphor of structure building)

> no separation, no transfer, no External Merge

### Summary

In this paper I have argued that syntactic structure is the result of a process that turns an unordered set of elements into an ordered pair (or an ordered n-tuple). This process is driven by the need to create an object that the Externalization Procedure (the interface components of Chomsky 1995) can process. It stops as soon as all the members of the unordered set (the Numeration) have become members of the ordered n-tuple.

The process by which the set is turned into an ordered n-tuple is Internal Merge. I have argued that this is the only process active in Narrow Syntax, eliminating External Merge. I have also argued that derivations are invariably networks of derivations, each a triple (Numeration, Narrow Syntax, Externalization Procedure) which yields an output that may be included in the Numeration for a next derivation (the layered derivations proposal of Zwart 2009a). In addition, the output of a derivation may feed into the Vocabulary needed for lexical insertion (as part of the Externalization Procedure) and may be called upon by the Externalization Procedure to act as an operator to an unbound variable. I have proposed that the latter process replaces A'-movement, showing that locality effects associated with A'-movement reduce to a simple ban on vacuous quantification applying at Externalization.

The process described cannot be simply characterized in terms of bottom-up or top-down derivation, suggesting this distinction is an artificial by-product of the commonly held separation between a Numeration and an Object Under Construction, requiring a process of transfer of elements from the Numeration to the Object Under Construction, already denounced in Bobaljik(1995). If we are correct, this transfer process, External Merge, is no more than a metaphor and should not be considered a fundamental process of structure building in a minimalist model of grammar.

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